

I CLAIM:

1. An engine comprising a fuel mixture of oxygen, as O<sub>2</sub>, and hydrogen, as H<sub>2</sub>, wherein temperature of combustion is at least partially controlled with air to combustion in excess over that required to perform combustion, and wherein said excess air reduces at least one of the combustion temperature and formation of nitrogen oxides.
2. The engine of claim 1, wherein mechanical rotating energy is created.
3. The engine of claim 2, wherein at least a part of said rotating mechanical energy turns a generator to create electrical energy.
4. The engine of claim 1, wherein at least part of a steam produced by combustion turns a generator to create electrical energy.
5. The engine of claim 3 or 4, wherein at least a portion of said electrical energy is used in the electrolysis of water to hydrogen and oxygen, and wherein at least a portion of at least one of said hydrogen and oxygen is used as fuel in said engine.
6. The engine of claim 1, wherein said air to combustion flows through a compressor.
7. The engine of claim 1, further comprising water in said fuel mixture.
8. The engine of claim 1, wherein at least a portion of the steam produced by combustion is converted to hydrogen by the corrosion of at least one metal.
9. The engine of claim 8, wherein the conversion of said steam into said hydrogen is increased by an electrical current in said metal(s).
10. The engine of claim 8 or 9, wherein said hydrogen is at least partially used as fuel in said engine.

11. The engine of claim 1, wherein a generator turns due to the movement of air or water, and wherein

said generator creates electrical energy, and wherein

said electrical energy is at least partially utilized in the electrolysis of water to hydrogen and oxygen, and wherein

at least a portion of at least one of said hydrogen and oxygen is used as fuel in said engine.

12. The engine of claim 1, wherein a photovoltaic cell creates electrical energy, and wherein

said electrical energy is at least partially used in the electrolysis of water to hydrogen and oxygen, and wherein

at least a portion of at least one of said hydrogen and oxygen is used as fuel in said engine.

13. The engine of claim 1, incorporating a cryogenic air separation unit, wherein  
at least a portion of the energy of combustion powers at least a portion of said cryogenic air separation unit.

14. The engine of claim 13, wherein the nitrogen separated from air in said cryogenic air separation unit is used to cool any portion of at least one selected from a list consisting of: said cryogenic air separation unit, the storage of oxygen, the storage of hydrogen, electrolysis, coolant for said engine, said engine and any combination thereof.

15. The engine of claim 13, wherein the nitrogen separated from air in said cryogenic air separation unit is at least partially used to cool air or water.

16. The engine of claim 1, incorporating a membrane air separation unit, wherein  
at least a portion of the energy of combustion powers at least a portion of said membrane air separation unit.

17. The engine of claim 1, incorporating a PSA air separation unit, wherein at least a portion of the energy of combustion powers at least a portion of said PSA air separation unit.
18. The engine of claim 13, 16 or 17, wherein the oxygen separated from air is at least one of enriched oxygen, pure oxygen and very pure oxygen.
19. The engine of claim 13, 16 or 17, wherein at least a portion the oxygen separated from air is used as fuel in said engine.
20. The engine of claim 1, wherein at least one selected from a list consisting of a: corrosion inhibitor, chelant, dispersant and any combination therein is added to water in said engine.
21. The engine of claim 1, wherein said engine performs at least one of: internal, turbine and heating combustion.
22. The engine of claim 1, wherein at least one of oxygen and hydrogen is stored in at least one of a cooled gas state and a liquid state by liquefaction.
23. The engine of claim 22, wherein compressor(s) for at least one of cooling and liquefaction is powered by at least one of said engine and a fuel cell.
24. The engine of claim 23, wherein said fuel cell is powered by hydrogen and at least one of oxygen and air.
25. The engine of claim 1, wherein at least one of said hydrogen and oxygen is stored in a mixture with frozen water crystals to form a gel.
26. The engine of claim 1, wherein at least one selected form a list consisting of: hydrogen, oxygen and water are preheated prior to combustion with the energy from at least one

selected from a list consisting of: ambient temperature, said engine, said engine exhaust, an electrical radiant heat source and any combination therein.

27. The engine of claim 2, wherein said mechanical rotating energy from said engine enters a transmission, wherein

said transmission engage in a manner that is inversely proportional to at least one of the torque and work output of said engine, and wherein

said transmission output mechanical rotating energy turn a generator to create electrical energy.

28. The engine of claim 27, wherein said transmission engage a flywheel capable of storing rotational kinetic energy, wherein

said flywheel turns said generator.

29. The engine of claim 27, wherein at least a portion of said electrical energy is used in the electrolysis of water to hydrogen and oxygen.

30. The engine of claim 29, wherein at least one of said hydrogen and oxygen is used as fuel in said engine.

31. The engine of claim 1, wherein a pressure control device is in said engine exhaust.

32. The engine of claim 1, wherein at least one of combustion heat energy and engine exhaust energy is used to heat at least one of a gas and a liquid.

33. The engine of claim 32, wherein at least one of the gas is air and the liquid is water.

34. The engine of claim 33, wherein said exhaust discharge directly into said air or water.

35. The engine of claim 1 or 13, wherein said engine is insulated.

36. The engine of claim 13, wherein hydrogen is separated.
37. The engine of claim 1, wherein the temperature of said engine exhaust is at least partially cooled with water.
38. The engine of claim 1 or 37, comprising jet propulsion.
39. The engine of claim 1, 12, 13, 14, 16, 17, 21, 22, 25, 26 or 37, comprising rocket propulsion.
40. The engine of claim 1, comprising transportation.